

299-W22-73 (A7877) Log Data Report

Borehole Information:

Borehole: 299-W22-73 (A7877)			Site: 216-U-12 Crib		
Coordinates (WA St Plane)		GWL¹ (ft): None		GWL Date: 10/24/05	
North 134512	East 567598	Drill Date 03/51	Elevation (TOC) Not available	Total Depth (ft) 60	Type Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded steel	0.7	8 5/8	8	5/16	0.7	60

Borehole Notes:

Casing diameter and stickup measurements for the 8-in. casing were acquired using a caliper and steel tape. Measurements are rounded to the nearest 1/16 inch. Logging data acquisition is referenced to the top of casing (TOC).

Spectral Gamma Logging System (SGLS) Equipment Information:

Logging System: Gamma 1E		Type: SGLS (70%) SN: 34TP40587A	
Effective Calibration Date: 03/04/05		Calibration Reference: DOE/EM-GJ864-2005	
		Logging Procedure: MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	2 Repeat			
Date	10/24/05	10/24/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	59.5	19.5			
Finish Depth (ft)	1.5	9.5			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A ²	N/A			
Pre-Verification	AE128CAB	AE128CAB			
Start File	AE128000	AE128059			
Finish File	AE128058	AE128069			
Post-Verification	AE128CAA	AE128CAA			
Depth Return Error (in.)	0	0			

Log Run	1	2 Repeat			
Comments	No fine-gain adjustment	No fine-gain adjustment			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Measurements are referenced to the top of casing. A repeat section was collected in this borehole to evaluate the logging system's performance.

Analysis Notes:

Analyst:	Henwood	Date:	11/02/05	Reference:	GJO-HGLP 1.6.3, Rev. 0
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Pre-run and post-run verifications for the logging systems were performed before and after each day's data acquisition. Acceptance criteria were met.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated using the EXCEL worksheet template identified as G1Emar05.xls. A casing correction for 0.3125-in.-thick casing was applied to the SGLS data. No corrections for dead time or water were required.

Results and Interpretations:

^{137}Cs was detected almost continuously from 1.5 to 57.5 ft. The maximum concentration was approximately 130 pCi/g at 23.5 ft.

Evidence of processed uranium (^{238}U and ^{235}U) exists from 19.5 to 29.5 ft. The maximum concentrations for ^{238}U and ^{235}U were approximately 40 and 2 pCi/g, respectively at 21.5 ft.

Elevated ^{232}Th concentrations (maximum of approximately 1.8 pCi/g) were indicated between 19 and 26 ft. It was determined that ^{232}Th is in secular equilibrium with its decay products, confirming that the assay is not influenced from other radionuclides. Logging experience at Hanford suggests it is unusual to detect elevated ^{232}Th at this depth in the vadose zone and to be associated with contaminants. However, it cannot be determined if the ^{232}Th is concentrated due to natural processes or is a result of man-made enhancement.

The repeat sections for the SGLS indicate good agreement for the naturally occurring and man-made radionuclides.

List of Plots:

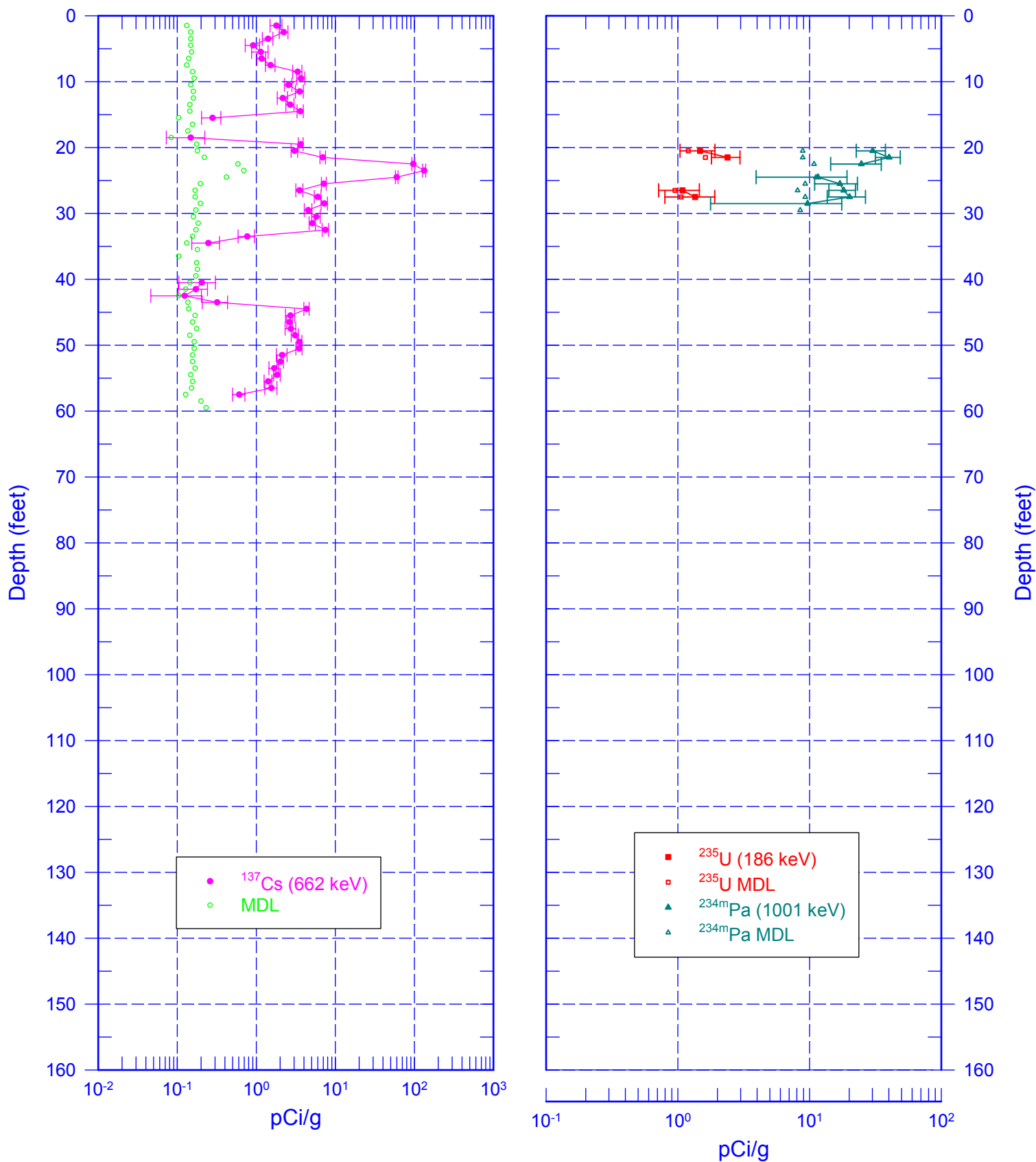
Man-Made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Dead Time
Repeat Section of Man-Made Radionuclides
Repeat Section of Natural Gamma Logs

¹ GWL – groundwater level

² N/A – not applicable

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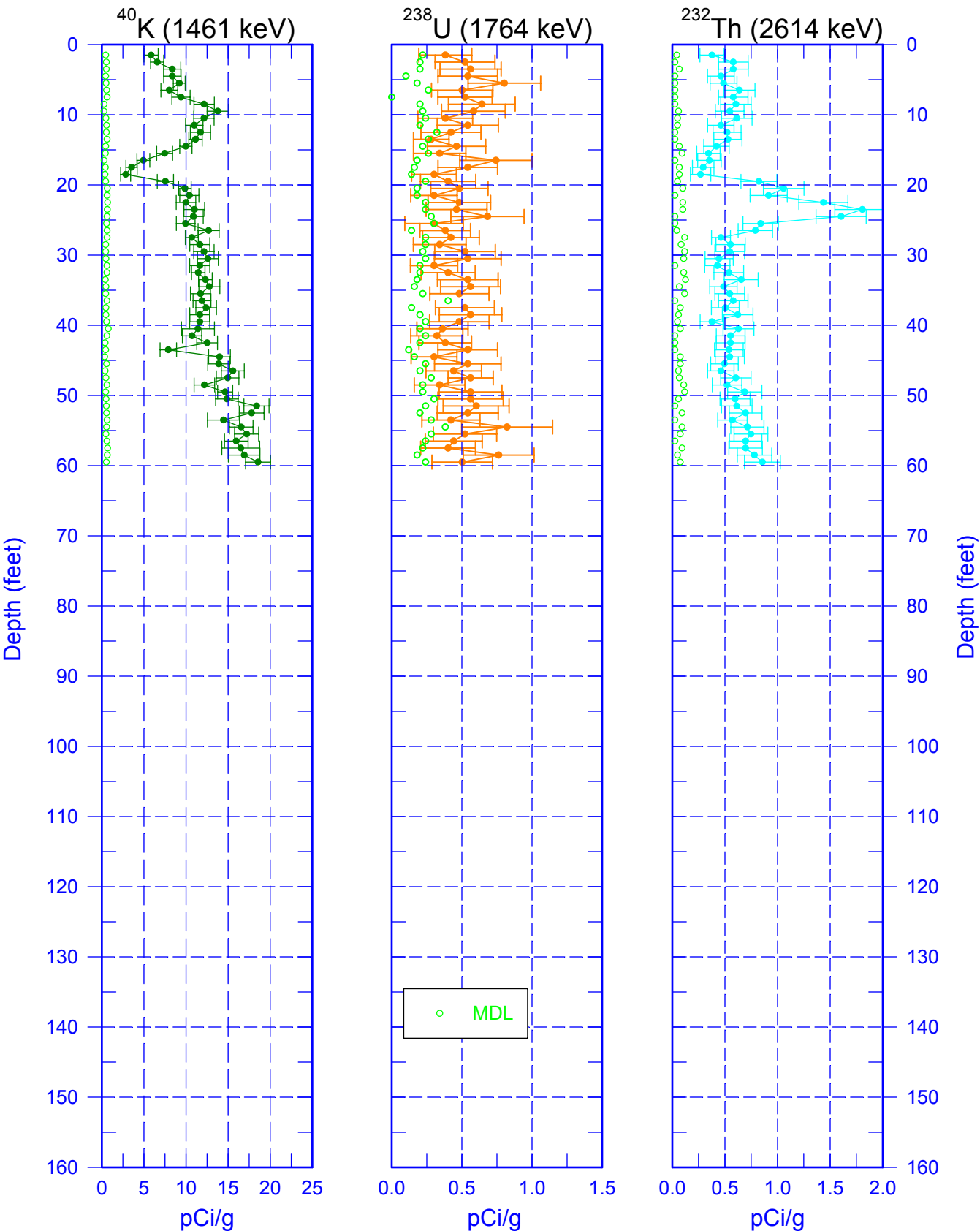
Man-Made Radionuclides



Zero Reference = Top of Casing

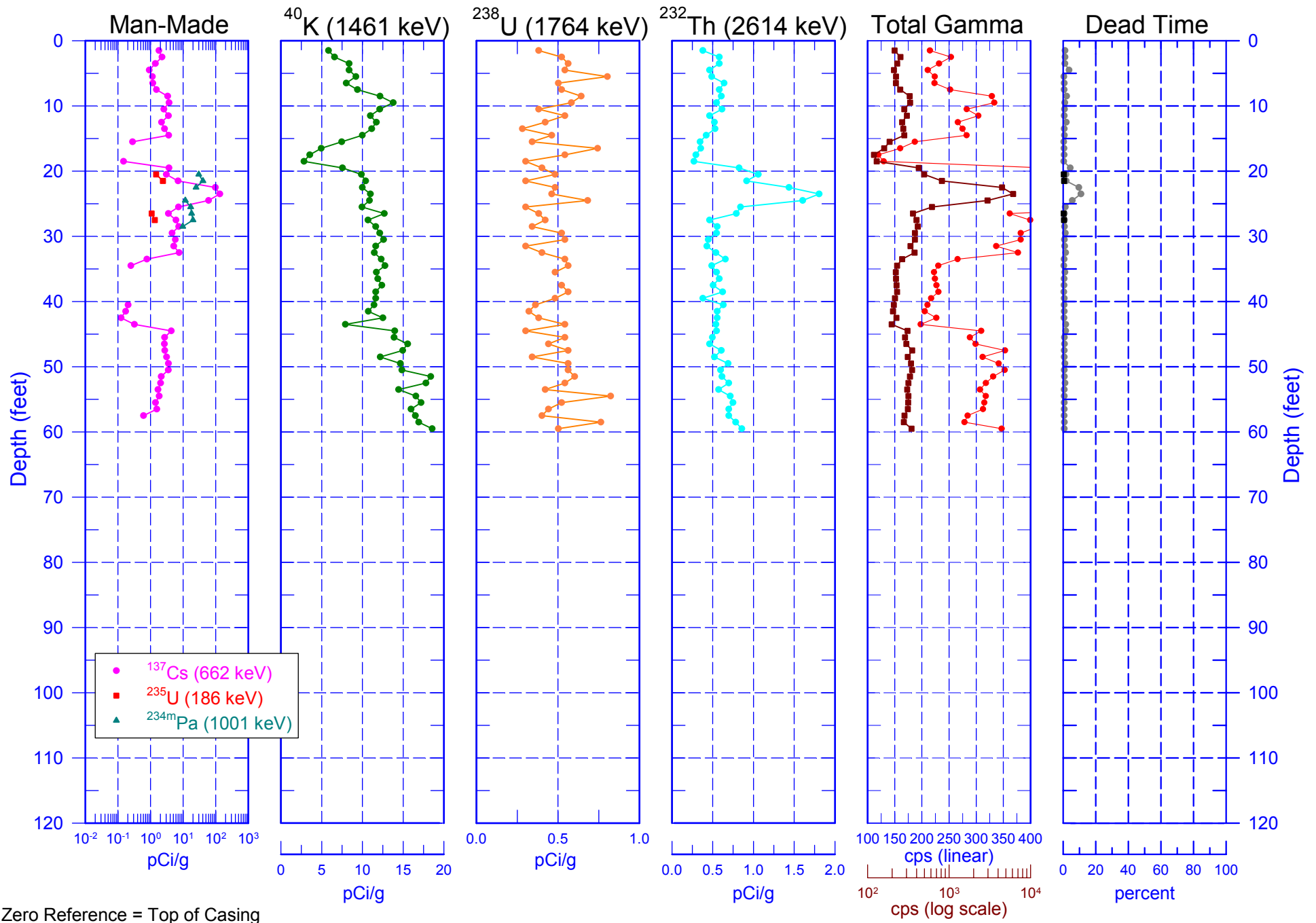
299-W22-73 (A7770)

Natural Gamma Logs



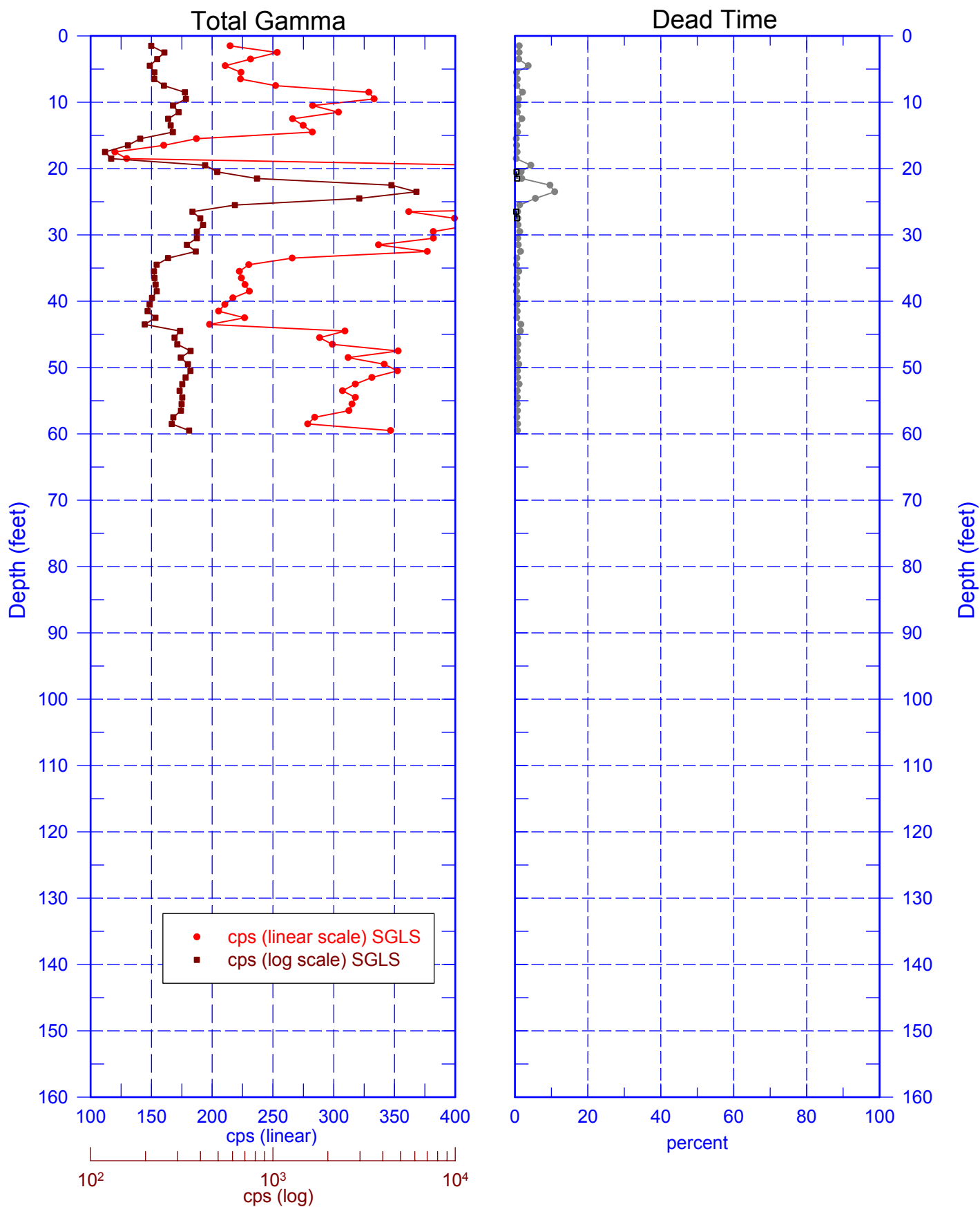
Zero Reference = Top of Casing

299-W22-73 (A7877) Combination Plot



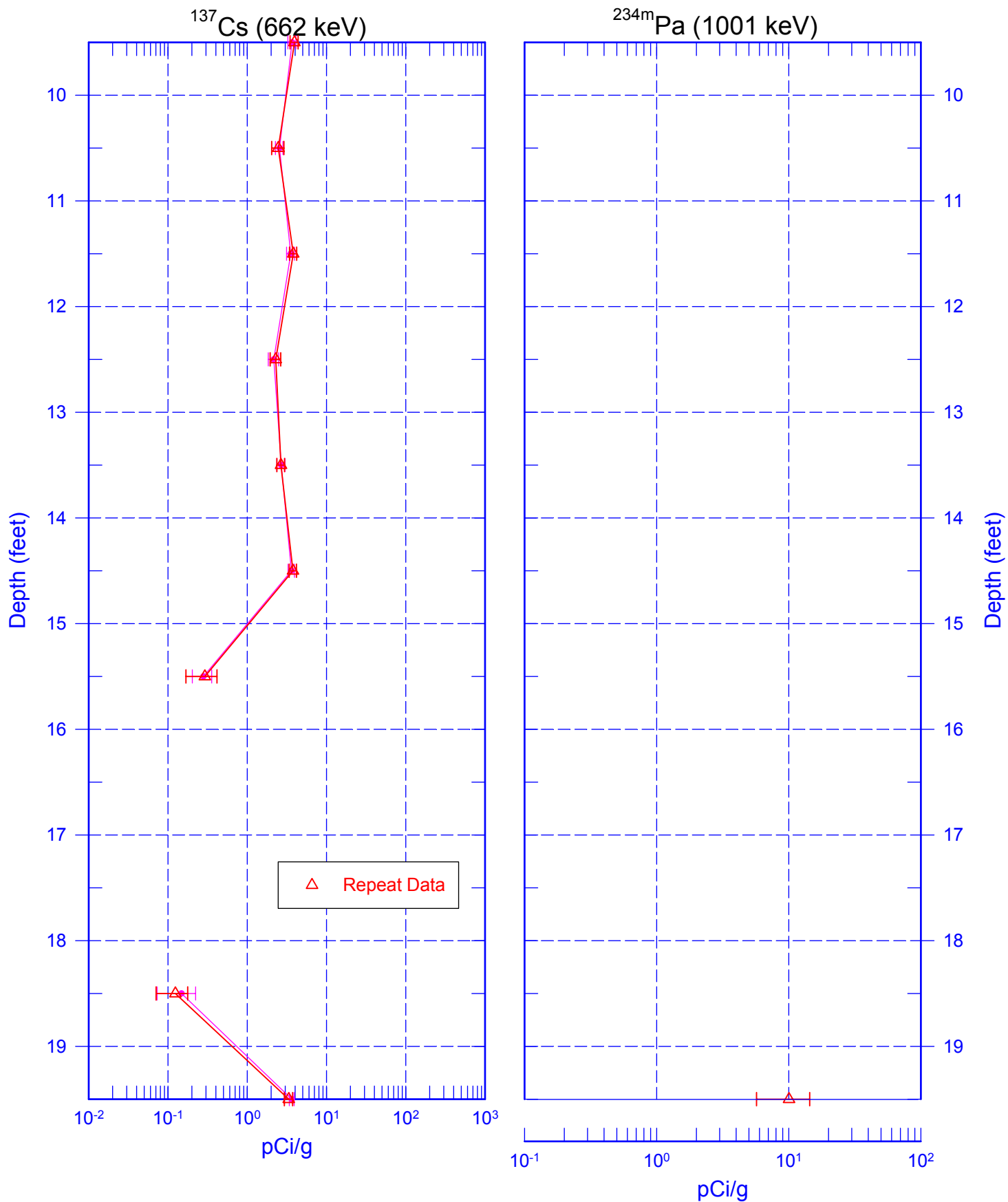
299-W22-73 (A7877)

Total Gamma & Dead Time



299-W22-73 (A7877)

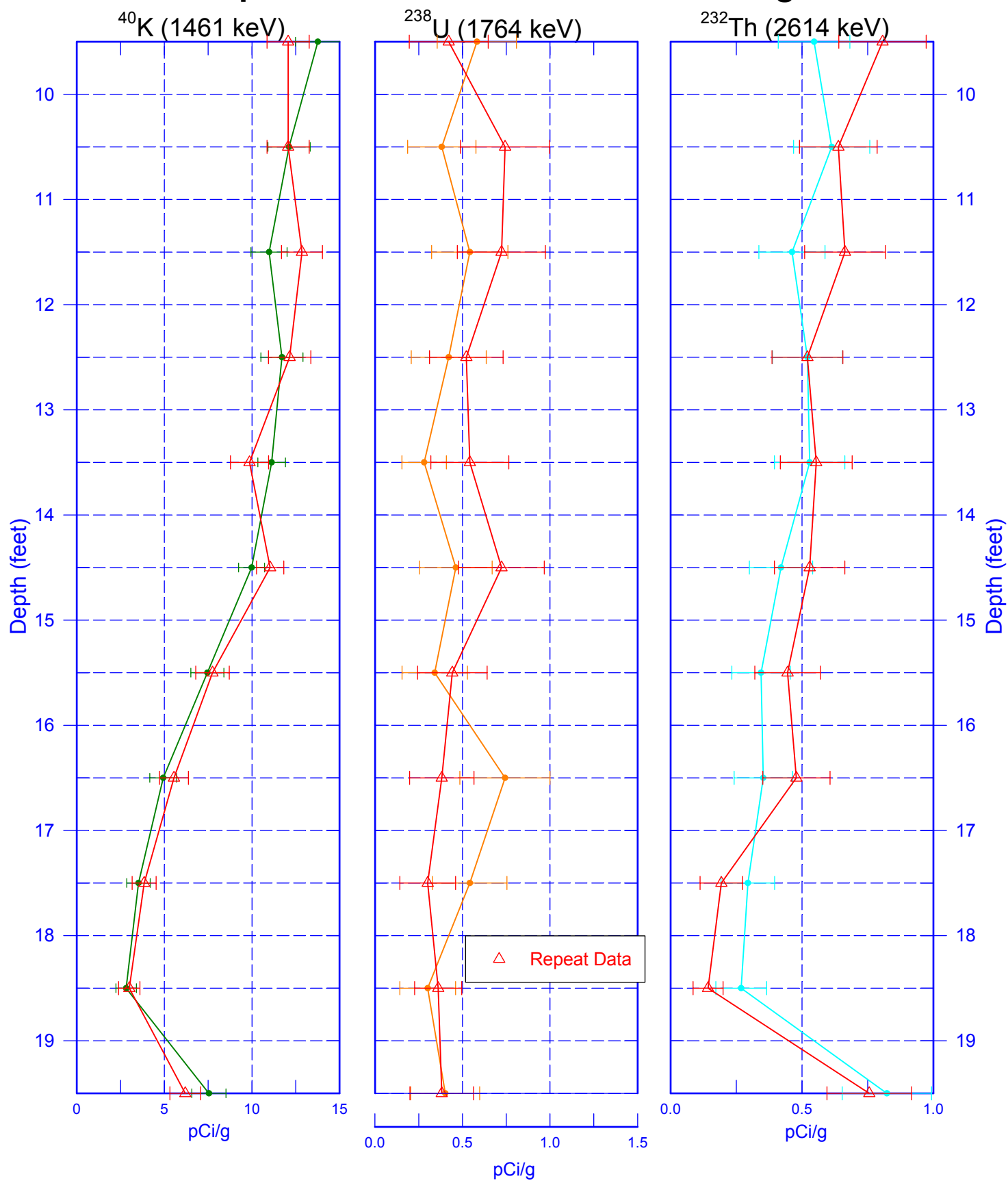
Repeat Section of Man-Made Radionuclides



Zero Reference = Top of Casing

299-W22-73 (A7877)

Repeat Section of Natural Gamma Logs



Zero Reference = Top of Casing